

**21.3.3 RECOMMENDED SAMPLE CONTAINERS, SAMPLE PRESERVATION, SAMPLE HOLDING TIMES, AND PERMISSIBLE SAMPLE TYPE**

Parmeter	Container	Preservative	Holding Time	Permissible Sample Type	Ref.
<b>Fish Samples</b>					
Organic Compounds	Wrap in aluminum foil (shiny side out)	Freeze	Not Specified	G or C	
Metals and Other Inorganic Compounds	Place in plastic Zip-loc bag	Freeze	Not Specified	G or C	
<b>WATER - LOW TO MEDIUM CONCENTRATION SAMPLES</b>					
Alkalinity	500-ml. or 1-liter polyethylene <sup>3</sup> with polyethylene or polyethylene lined closure	Cool, 4 °C	14 days	G or C	C
Acidity	500-ml. or 1-liter polyethylene <sup>3</sup> with polyethylene or polyethylene lined closure	Cool, 4 °C	14 days	G or C	C
Bacteriological	250-ml. glass with glass closure or plastic capable of being autoclaved	Cool, 4 °C	6 hours	G	C
Static Bioassay	1-gal. amber glass (not solvent rinsed)	Cool, 4 °C	48 hours	G or C	C
Biochemical Oxygen Demand (BOD)	1/2-gal. polyethylene <sup>3</sup> with polyethylene closure	Cool, 4 °C <sup>3</sup>	48 hours	G or C	C
Chlorine	500-ml. or 1-liter polyethylene <sup>3</sup> with polyethylene or polyethylene lined closure	None	28 days	G or C	C

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WATER - LOW TO MEDIUM CONCENTRATION SAMPLES (Continued)					
Chlorine Residual	In-situ, beaker or bucket	None	Analyze Immediately		
Conductivity	500-ml. or 1-liter polyethylene <sup>3</sup> with polyethylene or polyethylene lined closure	Cool, 4 °C	28 days (determine on site if possible)	G or C	C
Chromium, Hexavalent	1-liter polyethylene with polyethylene closure	Cool, 4 °C	24 hours	G	C
Cyanide	500-ml. or 1-liter polyethylene <sup>3</sup> with polyethylene or polyethylene lined closure	Ascorbic acid <sup>4,5</sup> Sodium Hydroxide, Ph >12, Cool, 4 °C	14 days	G	C
Dissolved Oxygen (Probe)	In-situ, beaker or bucket	None	Determine on site	G	C
Dissolved Oxygen (Winkler)	300-ml. glass BOD bottle (store in dark if possible)	Fix on site	8 hours (determine on site)	G	C
Fluoride	1-liter polyethylene <sup>3</sup> or 1/2 gal. polyethylene with polyethylene or polyethylene lined closure	None	28 days	G or C	C
WATER - LOW TO MEDIUM CONCENTRATION SAMPLES (Continued)					
Hardness	500-ml. or 1-liter polyethylene <sup>3</sup> with polyethylene or polyethylene lined closure	50% Nitric Acid <sup>4</sup> , pH <2	6 months	G or C	C
LAS	500-ml. or 1-liter polyethylene <sup>3</sup> with polyethylene or polyethylene lined closure	Cool, 4 °C	48 hours	G or C	C
Metals	1-liter polyethylene with polyethylene lined closure	50% Nitric Acid <sup>4</sup> , pH <2	6 months	G or C	C

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Metals, Dissolved	1-liter polyethylene with polyethylene lined closure	Filter on site <sup>4</sup> 50% Nitric Acid, pH <2	6 months	G	C
Nutrients <sup>6</sup>	1-liter polyethylene or 1/2 gal. polyethylene with polyethylene or polyethylene lined closure	50% Sulfuric Acid <sup>4</sup> , pH <2, Cool, 4 °C	28 days	G or C	C
Oil and Grease	1-liter widemouth glass with Teflon lined cap	50% Sulfuric Acid <sup>4</sup> , pH <2, Cool, 4 °C	28 days	G	C
<b>Organic Compounds - Extractable and Pesticide Scan</b>					
No Residual Chlorine Present	1-gal. amber glass or 2.5-gal. amber glass with Teflon lined cap	Cool, 4 °C	47 days <sup>7</sup>	G or C	A or C
<b>WATER - LOW TO MEDIUM CONCENTRATION SAMPLES (Continued)</b>					
Residual Chlorine Present	1-gal. amber glass or 2.5-gal. amber glass with Teflon lined cap	Add 3 mls. 10% Sodium Thiosulfate per gallon, cool, 4 °C	47 days <sup>7</sup>	G or C	A or C
<b>Organic Compounds - Purgeable (VOA)</b>					
No Residual Chlorine Present	3 40-ml vials with Teflon lined septum sealed caps	4 drops 1+1 HCL Cool, 4 °C	14 days	G	A or C
No Residual Chlorine Present	3 40-ml vials with Teflon lined septum sealed caps	Cool, 4 °C	7 days	G	A or C
Residual Chlorine Present	3 40-ml vials with Teflon lined septum sealed caps	Footnote 8	14 days	G	A or C
Organic Compounds - Specified and Pesticides (Non-Priority Pollutants such as Herbicides)	1-gal. glass (amber) or 2.5-gal. glass (amber) with Teflon lined closure	Footnote 9	47 days <sup>7</sup>	G or C	A or C

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Organic Halides - Total (TOX)	250-ml. amber glass with Teflon lined septum closure	Cool, 4 °C H <sub>2</sub> SO <sub>4</sub> to pH <2	28 days	G	A or E
pH	In-situ, beaker or bucket	None	Analyze Immediately	G	C
Phenols	1-liter amber glass with Teflon lined closure	50% H <sub>2</sub> SO <sub>4</sub> , pH <2, Cool, 4 °C	28 days	G	C

**WATER - LOW TO MEDIUM CONCENTRATION SAMPLES (Continued)**

Phosphate - Ortho	500-ml. or 1-liter polyethylene with polyethylene or polyethylene lined closure	Filter on site, Cool, 4 °C	48 hours	G	C
Phosphorus, Total Dissolved	500-ml. or 1-liter polyethylene with polyethylene or polyethylene lined closure	Filter on site, 50% H <sub>2</sub> SO <sub>4</sub> , pH <2, Cool 4 °C	28 days	G	C
Solids, Settleable	1/2-gal. polyethylene with polyethylene closure	Cool, 4 °C	48 hours	G or C	C
Solids (Total and Suspended, etc.)	500-ml. or 1-liter polyethylene <sup>3</sup> with polyethylene or polyethylene lined closure	Cool, 4 °C	7 days	G or C	C
Sulfates	500-ml. or 1-liter polyethylene <sup>3</sup> with polyethylene or polyethylene lined closure	Cool, 4 °C	28 days	G or C	C
Sulfides	500-ml. or 1-liter polyethylene <sup>3</sup> with polyethylene or polyethylene lined closure	2-ml. Zinc Acetate <sup>4</sup> , Conc NaOH to pH >9, Cool, 4 °C	7 days	G	C
Temperature	In-situ, beaker or bucket	None	Determine on site	G	C

**WATER - LOW TO MEDIUM CONCENTRATION SAMPLES (Continued)**

Turbidity	500-ml. or 1-liter polyethylene <sup>3</sup> with polyethylene or polyethylene lined closure	Cool, 4 °C	48 hours	G or C	C
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SOIL, SEDIMENT OR SLUDGE SAMPLES - LOW TO MEDIUM CONCENTRATIONS					
Metals	8-oz. widemouth glass with Teflon lined closure	Cool, 4 °C	6 months	G or C	A
Nutrients Including: Nitrogen, Phosphorus, Chemical Oxygen Demand	500-ml. polyethylene with polyethylene closure or 8-oz. widemouth glass with Teflon lined closure	Cool, 4 °C	Not Specified	G or C	A
Organics - Extractable	8-oz. widemouth glass with Teflon lined closure	Cool, 4 °C	14 days	G or C	A
Organics - Purgeable (VOA)	2-oz. (60-ml.) VOA vial with Teflon lined septum seal	Cool, 4 °C	14 days	G or C	A
Other Inorganic Compounds Including Cyanide	500-ml. polyethylene with polyethylene closure or 8-oz. widemouth glass with Teflon lined closure	Cool, 4 °C	Not Specified	G or C	A

Abbreviations: G = Grab  
C = Composite  
ASAP = As Soon As Possible  
NS = Not Specified

NOTE: The analytical laboratory staff should be consulted prior to making any changes to any of the above sampling protocols.

## Footnotes

1. The TCLP method requires the leaching of 25 gms of solid for volatile organics and 100 gm of solids for all other parameters. If the sample is low in solids, additional sample containers may be required to provide sufficient sample for the TCLP leach extraction.
2. These are total holding times for TCLP that cover sampling through analysis. The holding times are broken down as follows: TCLP volatile organics - 14 days from collection to TCLP extraction plus 14 days from leach extraction to analysis; extractable organics, pesticides & herbicides - 7 days from collection to TCLP extraction plus 7 days to solvent extraction of leachate plus 40 days to analysis of extract; mercury - 28 days from collection to TCLP extraction plus 28 days to analysis; metals except mercury - 180 days from collection to TCLP extraction plus 180 days to analysis.
3. Use indicated container for single parameter requests or 1/2-gallon polyethylene container for multiple parameter requests except those including BOD. Use a 1-gallon polyethylene container for multiple parameter requests which include BOD.
4. Must be preserved in the field at time of collection.
5. Use ascorbic acid only if the sample contains residual chlorine. Test a drop of sample with potassium iodide-starch test paper; a blue color indicates need for treatment. Add ascorbic acid, a few crystals at a time, until a drop of sample produces no color on the indicator paper. Then add an additional 0.6 g of ascorbic acid for each liter of sample volume.
6. May include nitrogen series (ammonia, total Kjeldahl nitrogen, nitrate-nitrite), total phosphorus, chemical oxygen demand and total organic carbon.
7. Samples must be extracted within seven days and extract must be analyzed within 40 days.
8. Collect the sample in a 4-oz. soil VOA container which has been pre-preserved with four drops of 25 percent ascorbic acid solution. Gently mix the sample and transfer to a 40-ml VOA vial that has been prepreserved with four drops 1+1 HCl, cool to 4 °C.
9. See Organic Compounds - Extractable (page 4). The analytical laboratory staff should be consulted for any special organic compounds analyses in order to check on special preservation requirements and/or extra sample volume.

## REFERENCES

- A. US-EPA, Test Methods for Evaluating Solid Waste, SW-846, 3rd Edition, Office of Solid Waste and Emergency Response, Washington,DC, Nov. 1986.
- B. US-EPA, Test Methods for Evaluating Solid Waste, SW-846, Office of Solid Wastes, Washington, DC, 1982.
- C. 40 CFR Part 136, Federal Register, Vol. 49, No. 209, October 26, 1984.
- D. US-EPA, Region IV, Environmental Services Division, "Ecological Support Branch, Standard Operating Procedures Manual," latest version.
- E. EPA Interim Method 450.1, "Total Organic Halide," US-EPA, ORD, EMSL, Physical and Chemical Methods Branch, Cincinnati, Ohio, November 1980.
- F. US-EPA, Analytical Methods for the National Sewage Sludge Survey, Office of Water Regulations and Standards, Washington, DC, Aug. 1989.